REMARKS

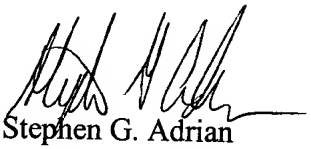
The above amendment is submitted to place the specification and claims in substantially the same condition as to the claims which have been amended under Article 34 in the international application. An English translation of the annexes of the PCT international preliminary examination report is enclosed. Early and favorable action is awaited.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

In the event there are any additional fees required, please charge our Deposit Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, WESTERMAN, HATTORI,
McLELAND & NAUGHTON, LLP



Stephen G. Adrian
Reg. No. 32,878

Atty. Docket No. 011147
Suite 1000
1725 K Street, N.W.
Washington, D.C. 20006
Tel: (202) 659-2930

SGA/yap

Enclosures: Translation of the Annexes of the PCT International Preliminary Examination Report with Substitute pages 4-7.

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Claims 1-7 have been amended as follows:

1. (Amended) ~~A method of making~~ An n-type semiconductor diamond, characterized ~~in that it comprises~~ by:

~~mechanically polishing a diamond substrate to make it an inclined diamond substrate;~~

~~subjecting a surface of said inclined diamond substrate to a smoothening treatment to make the surface even;~~

~~exciting a raw material gas made of a volatile hydrocarbon compound, a sulfur compound and a hydrogen gas by a microwave plasma while maintaining at a given temperature said diamond substrate surface smoothened as aforesaid to cause n-type semiconductor diamond to grow epitaxially on said surface smoothened substrate.~~

a crystalline perfectness whereby:

it has impurity atoms constituted by sulfur atoms forming a single donor level of 0.38 eV,

it has a carrier mobility temperature dependency which at a temperature (T) range in excess of the room temperature is T-3/2 dependent, and

it has a diamond peak in its Raman spectrum, whose half width is 2.6 cm^{-1};

a crystalline perfectness whereby:

light emission by excitons is observable; and

a crystalline perfectness whereby:

a distinct Kikuchi pattern in its reflection electron diffraction analysis is observable.

2. (Amended) ~~A method of making~~ An n-type semiconductor diamond as set forth in claim 1, characterized in that ~~said diamond substrate comprises a diamond (100) face oriented substrate~~ at a room temperature it has a carrier concentration not less than 1.4×10^{13} cm^{-3} and a carrier mobility not less than 580 $cm^2V^{-1}s^{-1}$.

3. (Amended) A method of making an n-type semiconductor diamond ~~as set forth in claim 1~~, characterized in that ~~said inclined substrate is formed by mechanically polishing a diamond (100) face oriented substrate surface so that its face normal is inclined at an angle in a range between 1.5 degree and 6 degrees with respect to its <100> direction in a plane made by either its <100> and <010> directions or its <100> and <001> directions~~ it comprises:

mechanically polishing a diamond substrate to make it an inclined diamond substrate;

subjecting a surface of said inclined diamond substrate to a smoothening treatment make it even;

exciting a raw material gas made of a volatile hydrocarbon compound, a sulfur compound and a hydrogen gas by a microwave plasma while maintaining at a given temperature said substrate surface smoothened as aforesaid to cause n-type semiconductor diamond to grow epitaxially on said surface smoothened substrate.

4. (Amended) A method of making an n-type semiconductor diamond as set forth in claim ~~1~~ 3, characterized in that said ~~smoothening treatment comprises either a treatment in which said inclined substrate is exposed to a hydrogen plasma or a treatment in which it is exposed to an oxidizing flame such as an acetylene combustion flame~~ diamond substrate is a diamond (100) face oriented substrate.

5. (Amended) A method of making an n-type semiconductor diamond as set forth in claim ~~1~~ 3, characterized in that said ~~hydrogen plasma exposure treatment comprises a treatment of exposing said inclined substrate to the hydrogen plasma of a hydrogen pressure of 10 to 50 Torr and a microwave output of 200 to 1200 W at a substrate temperature of 700 to 1200 for a period of 0.5 hour to 5 hours~~ inclined substrate is formed to consist of steps each in the order of an atomic layer, by mechanically polishing a diamond (100) face oriented substrate so that its face normal is inclined at an angle in a range between 1.5 degree and 6 degrees with respect to its <100> direction in a plane made by either its <100> and <010> directions or its <100> and <001> directions.

6. (Amended) A method of making an n-type semiconductor diamond as set forth in claim ~~1~~ 3, characterized in that said ~~given substrate temperature lies in a range between 700 and 1100, preferably at 830~~ hydrogen plasma exposure treatment comprises a treatment of exposing said inclined substrate to the hydrogen plasma of a hydrogen pressure of 10 to 50 Torr and a microwave output of 200 to 1200 W at a substrate temperature of 700 to 1200 for a period of 0.5 hour to 5 hours, thereby to make even said substrate surface in the order of an atomic layer.

7. (Amended) A method of making an n-type semiconductor diamond as set forth in claim ~~1~~ 3, characterized in that said ~~volatile hydrocarbon compound is an alkane or an alkene~~ given substrate temperature lies in a range between 700 and 1100°C, preferably at 830°C.